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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/538,219	06/09/2005	Herbert Friedrich Boerner	DE 020314	9419

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EXAMINER	
WILSON, MICHAEL H	
ART UNIT	PAPER NUMBER
1794	
MAIL DATE	DELIVERY MODE
10/16/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/538,219	BOERNER, HERBERT FRIEDRICH	
	Examiner	Art Unit	
	MICHAEL WILSON	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 August 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 12-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 12-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Request for Continued Examination

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 14 August, 2008 has been entered.

2. It is noted that applicants' amendment filed 14 August, 2008 which was previously not entered for the reasons set forth in the Advisory Action mailed 29 August, 2008 has now been entered. The following action is based on this now entered amendment.

Claim Objections

3. Claim 6 is objected to because the claim is in an improper Markush group format. A Markush-type claim recites alternatives in a format such as "wherein R is a material selected from the group consisting of A, B, C and D" or "wherein R is A, B, C or D." See Ex parte Markush, 1925 C.D. 126 (Comm'r Pat.1925). See MPEP 2173.05(h).

Appropriate correction is required.

4. Claim 9 is objected to because of the following informalities: Line 5 of claim 9 reads "wherein a lowest-energy triplet state" should read --wherein the lowest-energy triplet state--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 5, 9, and 12-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 5, the claim is indefinite because the claim includes compounds with multiple substituents on a single position of the biphenyl compound. However such a compound is impossible, a single position on a biphenyl can only contain more than one substituent. For the purposes of this action the claim is interpreted to read --a biphenyl substituted in more than one meta position.--

Regarding claim 9, it is unclear if the "one or more singlet states and one or more triplet states" is referring to the emissive complex or the hole conductive organic material. For the purposes of this action the claim is interpreted to read --a mixing layer comprising a light-emitting material having a metallo-organic complex compound, and a hole conductive organic material with one or more singlet states and one or more triplet states--.

Further regarding claim 9, the claim recites the limitation "the conductive organic material" in line 5. There is insufficient antecedent basis for this limitation in the claim. For the purposes of this action the claim is interpreted to read --the hole conductive organic material--.

Regarding claim 12, the claim is indefinite because it depends from a canceled claim. For the purposes of this action the claim is interpreted to depend from claim 9.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Lamansky et al. (US 2002/0182441 A1) as evidenced by Thompson et al. (US 2003/0124381 A1).

Regarding claims 1 and 2, Lamansky et al. discloses an organic electroluminescent component having a layer composite comprising:

- a substrate layer [0097],
- a first transparent electrode layer [0097],
- a mixing layer (page 23, first entry of table II, and [0137]) having

- a matrix of a conductive organic material with at least one singlet and triplet state ([0143] CBP) which is a p-conductive or n-conductive material (page 23, first entry of table II),
- in this matrix, a light-emitting material comprise an metallo-organic complex compound with an emissive triplet state ([0046], page 23, first entry of table II), and

- a second electrode ([0097], LiF and Al bilayer),
- wherein the lowest-energy triplet state of the conductive organic material is higher than the emissive triplet state of the metallo-organic complex compound by an energy difference E_t with is greater than or equal to 2000 cm^{-1} (page 23 tables II first entry PtOEP in CBP, triplet energies in table I).

Regarding the limitations of the matrix material being a hole conducting material, CBP disclosed as a matrix material by Lamansky et al. is known to be a hole conducting material and inherently has the ability to conduct holes as evidenced by Thompson et al. [0064].

9. Claims 1-3, 6, 7, 9, 12, 13, 16, and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Ise et al. (US 2002/0028329 A1) and as evidenced by Holmes et al. (Blue organic electroluminescence using exothermic host-guest energy transfer.) and Thompson et al. (US 2003/0124381 A1).

Regarding claims 1 and 9, Ise et al. discloses an organic electroluminescent component having a layer composite comprising:

- a substrate layer [0180],
- a first transparent electrode layer ([0010] and [0172]),
- a mixing layer (light emitting layer [0009]) having
    - a matrix of a conductive organic material which is a p-conductive or n-conductive material ([0010]; page 15, compound A-10),
    - in this matrix, a light-emitting material comprise an metallo-organic complex compound with an emissive triplet state [0149], and
- a second electrode [0010],
- wherein the lowest-energy triplet state of the conductive organic material is higher than the emissive triplet state of the metallo-organic complex compound by an energy difference Et. ([00029] and [0010]).

Regarding the singlet states of the host compound, while Ise et al. do not explicitly disclose the existence of a singlet state for the host compounds the compounds disclosed by Ise et al. as host compounds are known to posses both singlet and triplet states. Specifically aryl amine compounds of the type such as compound A-10 (page 15) are known to inherently posses both types of states as evidenced by Holmes et al. (page 2423, column 1, lines 12-13, and page 2424, column 1, lines 15-17, note: fluorescent is emission from a singlet state).

Regarding the limitations of the matrix material being a hole conducting material, compound A-10 disclosed as a matrix material by Ise et al. is known to be a hole conducting material and inherently has the ability to conduct holes as evidenced by Thompson et al. [0064].

Regarding claims 2 and 12, Ise et al. discloses an organic electroluminescent device as set forth above. Additionally the reference discloses wherein the energy difference between the matrix and the light-emitting compound is E_t >= 2000 cm-1 ([0032]; [0195] table 1, examples 2, 4, and 8-10, note Ise et al. measure the T1 energy level of both host and light-emitting material in kcal/mol [0032]).

Regarding claims 3, 7, 13, and 17, Ise et al. discloses the device as set forth above. Additionally the reference discloses wherein the conductive organic material comprises a structural element which is a benzene ring substituted with an organic substituent R, a carbazole group, in the meta position (page15, compound A-10).

Regarding claims 6 and 16, Ise et al. disclose an organic electroluminescent device as set forth above. Additionally the reference discloses wherein the conductive organic material is a conductive organic monomer (page 15, compound A-10) or polymer [0118].

10. Claims 1, 3-6, 9, and 13-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Adachi et al. (US 2002/0180347 A1) as evidenced by Holmes et al. (Blue organic electroluminescence using exothermic host-guest energy transfer.).

Regarding claims 1 and 9, Adachi et al. discloses an organic electroluminescent component having a layer composite comprising:

- a substrate layer [0027],
- a first transparent electrode layer [0032]-[0033],
- a mixing layer ([0020] and [0038]) having

- a hole conducting matrix of a conductive organic material which is a p-conductive or n-conductive material ([0020] and [0038]),
- in this matrix, a light-emitting material comprise an metallo-organic complex compound with an emissive triplet state ([0020] and [0038]),

- a second electrode [0032]-[0033].

Regarding the singlet and triplet states of the host compound, while Adachi et al. do not explicitly disclose the existence of singlet and triplet states for the host compound, the compound disclosed by Adachi et al. is known to posses both singlet and triplet states. Additionally the host compound of Adachi et al. is within the genus disclosed by applicant as possessing both singlet and triplet states. Therefore the hole conducting host compound of Adachi et al. is considered to meet the present claim limitation.

Further regarding the triplet energy of the host compound, while Adachi does not disclose the energy of the triplet state the compound is within the formula disclosed by applicant as having a triplet energy higher than that of the light-emitting compound. Therefore since the compound disclosed by Adachi et al. being within the formula claimed by applicant, the triplet energy of the compound would be expected inherently to have the same properties as disclosed by applicant. Recitation of a newly disclosed property does not distinguish over a reference disclosure of the article or composition claims. *General Electric v. Jewe Incandescent Lamp Co.*, 67 USPQ 155. *Titanium Metal Corp. v. Banner*, 227 USPQ 773. Applicant bears responsibility for proving that

reference composition does not possess the characteristics recited in the claims. In *re Fritzgerald*, 205 USPQ 597, In *re Best*, 195 USPQ 430.

Regarding claims 3, 13 and 14, Adachi et al. discloses the device as set forth above and characterized in that the conductive organic material comprises a structural element which is a benzene ring or biphenyl substituted with an organic substituent R in the meta position [0020].

Regarding claims 4, 5, and 15, Adachi et al. discloses the device as set forth above and characterized in that the conductive organic material comprises a structural element which is a biphenyl substituted in two meta positions [0020].

Regarding claims 6 and 16, Adachi et al. disclose an organic electroluminescent device as set forth above. Additionally the reference discloses wherein the conductive organic material is a conductive organic monomer [0020].

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. Claims 7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adachi et al. (2002/0180347 A1) as applied to claim 1 above and in view of Maeda et al. (US 5,185,228).

Regarding claims 7 and 17, Adachi et al. disclose all the claim limitations as set forth above. Additionally the reference teaches aryl amine compounds are suitable for the host material in the emissive hole transporting layer Adachi et al. [0020] However the reference does not explicitly the triplet energy of the host compound or the host being a compound substituted by aryl amine groups in the meta position.

Maeda et al. teach an electrophotosensitive device (abstract). The reference teaches meta substituted benzene compounds with aryl amine substituents (column 4, line 65 to column 5, line 54) as a charge transfer compound. The meta substituted benzene is taught to transfer energy to a compound with a lower triplet energy. The reference teaches the compounds prevent a decrease is charge amount and sensitivity in the device (column 4, line 65 to column 5, line 2), which would result in an increase is device stability.

It would be obvious to one of ordinary skill in the art at the time of the invention to use the meta substituted benzene compounds of Maeda et al., which have multiple meta substituted aryl amine groups, as a host material in the emissive hole transporting layer of Adachi et al. One or ordinary skill in the art would reasonably expect such compounds to be suitable given Adachi et al. discloses aryl amine compounds as

suitable and Maeda et al. teach the compounds to transfer energy to lower triplet energy levels of other compounds, which is a critical part of the process that enables the phosphorescent dopant in the layer to emit light. One of ordinary skill in the art would be motivated by a desire to improve the device stability.

Regarding the singlet and triplet energy of the meta substituted benzene compounds of Maeda et al. While the reference does not explicitly disclose the singlet and triplet energy of the compounds, the compounds are within the formula disclosed by applicant as possessing a singlet state and a triplet energy which would be greater than the triplet energy of the light-emitting compound. Therefore since the compounds disclosed by Maeda et al. being within the formula claimed by applicant, the singlet and triplet states of the compounds would be expected inherently to have the same properties as disclosed by applicant. Recitation of a newly disclosed property does not distinguish over a reference disclosure of the article or composition claims. *General Electric v. Jewe Incandescent Lamp Co.*, 67 USPQ 155. *Titanium Metal Corp. v. Banner*, 227 USPQ 773. Applicant bears responsibility for proving that reference composition does not possess the characteristics recited in the claims. In *re Fritzgerald*, 205 USPQ 597, In *re Best*, 195 USPQ 430.

14. Claims 5, 7, 8, 15, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adachi et al. (2002/0180347 A1) as applied to claim 1 above and in view of Shi et al. (2001/0023029 A1).

Regarding claims 5, 7, 8, 15, 17 and 18, Adachi et al. disclose all the claim limitations as set forth above. Additionally the reference teaches aryl amine compounds

are suitable for the host material in the emissive hole transporting layer Adachi et al. [0020] However the reference does not explicitly the triplet energy of the host compound or the host being a compound substituted by phenyl and phenyl derivative groups in the meta position.

Shi et al. teach a similar organic electroluminescent device (abstract). The reference teaches substituent benzene and biphenyl compounds, bearing phenyl and phenyl derivative as substituents, as hole transporting compounds ([0044]; pages 5-10, compounds 9-15, 17-41, 43-46, and 49). The compounds are taught to prevent fluorescence quenching improving the luminous efficiency of the device [0009].

It would be obvious to one of ordinary skill in the art at the time of the invention to use the hole transporting compound of Shi et al. as the host material for the in the emissive hole transporting layer of Adachi et al. One of ordinary skill in the art would reasonably expect such a combination to be suitable given that Shi et al. teach the compounds as hole transporting compounds used inorganic electroluminescent devices. One of ordinary skill in the art would be motivated by a desire to improve the luminous efficiency of the device.

Regarding the singlet and triplet energy of the meta substituted benzene and biphenyl compounds of Shi et al. While the reference does not explicitly disclose the singlet and triplet energy of the compounds, the compounds are within the formula disclosed by applicant as possessing a singlet state and a triplet energy which would be greater than the triplet energy of the light-emitting compound. Therefore since the compounds disclosed by Shi et al. being within the formula claimed by applicant, the

singlet and triplet states of the compounds would be expected inherently to have the same properties as disclosed by applicant. Recitation of a newly disclosed property does not distinguish over a reference disclosure of the article or composition claims. *General Electric v. Jewe Incandescent Lamp Co.*, 67 USPQ 155. *Titanium Metal Corp. v. Banner*, 227 USPQ 773. Applicant bears responsibility for proving that reference composition does not possess the characteristics recited in the claims. In *re Fritzgerald*, 205 USPQ 597, In *re Best*, 195 USPQ 430.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL WILSON whose telephone number is (571) 270-3882. The examiner can normally be reached on Monday-Thursday, 7:30-5:00PM EST, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on (571) 272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

16. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MHW

/Callie E. Shosho/
Supervisory Patent Examiner, Art Unit 1794